Notes.

THE Linnean Society will be engaged to-day, June 17, in celebrating the centenary of Sir Joseph Banks, Bart., who died on June 19, 1820. On the death of Carl von Linné in 1778, Banks endeavoured to buy his herbarium, but that was acquired by Linné's son for the remainder of his short life. Five years later, when the herbarium was again for disposal upon the death of the younger Linné, Banks had changed his mind, for when the collections were offered he passed the offer to Dr. J. E. Smith, recommending the purchase, as it would be of great value to him as a young naturalist. On getting the herbarium Smith spent the winter of 1784–85 in collating his new acquisition with the Banksian collection, with the invaluable help of Jonas Dryander, Banks's factotum; then, after a tour abroad, Smith took counsel with his friends, and the Linnean Society came into being. Banks was chosen as honorary member immediately, and retained that position until his death. Besides continual gifts of books, the cast from Inlander's relief of Linné, which was the model for Wedgewood's plaque, and objects of natural history, he paid for the entire cost of illustration for the first volume of the Transactions. It is well that such liberal actions should be recalled to the memory of the present generation.

WE have received from the secretary of the Rubber Growers' Association particulars of a competition which has been organised by the association with the view of extending the industrial uses of rubber. A sum of 5000*l.* is offered for ideas and suggestions in this connection, the amount to be divided into the following awards, viz. one prize of 1000*l.*, three prizes of 500*l.* each, ten prizes of 100*l.* each, and a sum not exceeding 1500*l.* to be divided amongst the remaining competitors whose suggestions are considered to be practical, according to the relative value of the proposals. Among the conditions of the competition it is noted that special value will be attached to ideas of a thoroughly practical nature, supported by detailed information likely to make them effective; and that the relative value of the suggestions which are deemed practical will depend upon the quantity of raw rubber which their adoption would absorb, special consideration being given to proposals likely to utilise rubber in large quantities. The most important condition, however, is that relating to the protection by letters patent of any process, method, or apparatus submitted by competitors; this regulation is too long to quote in detail here. Full particulars of the competition may be obtained from the Rubber Growers' Association (Department C), 38 Eastcheap, E.C.3; the closing date of the competition is December 31 next.

THE Albert medal of the Royal Society of Arts for 1920 has been awarded to Prof. A. A. Michelson, For.Mem.R.S., professor of physics in the University of Chicago, and Nobel laureate for physics in 1907.

THE enterprise of the Royal Horticultural Society in holding a three-days' show at Cardiff on July 6–8 marks a new departure in the society's history. Not in the present generation has it held such a meeting in the provinces, and it has now taken this step to foster the interest in gardening and the production of home-grown produce that it did so much to develop during the war period. The scientific section will contain exhibits showing how to identify and overcome the various garden pests, as well as displays of the various appliances used in repelling their attacks.

THE David Syme prize, with medal, for the year 1920 has been awarded to Mr. Frederick Chapman, palæontologist to the National Museum and lecturer in palæontology in the University of Melbourne. Mr. Chapman, before his first appointment in Australia, was known to a wide circle in London through his work under Prof. Judd and his association with Prof. T. Rupert Jones in the investigation of fossil Foraminifera. Foraminifera have always remained his special object of research, but he has published a large number of papers in all branches of palæontology, including a revision of the fossil fish-remains of New Zealand. Few men have rendered the results of their observations available with such zeal and regularity, and Mr. Chapman, from the date of his earliest papers, when he described the preparation of thin sections of minute objects for the microscope, has brought to his painstaking studies the enjoyment of an artist in his work.

AT the anniversary meeting of the Linnean Society on May 27, the following officers and members of council were elected:—*President:* Dr. A. Smith Woodward. *Treasurer:* Mr. H. W. Monckton. *Secretaries:* Dr. B. Daydon Jackson, Prof. E. S. Goodrich, and Dr. A. B. Rendle. *Council:* Mr. E. G. Baker, Mr. H. Bury, Prof. Margaret Benson, Mr. E. T. Browne, Mr. Stanley Edwards, Prof. J. B. Farmer, Prof. E. S. Goodrich, Capt. A. W. Hill, Dr. B. Daydon Jackson, Mr. C. C. Lacaita, Mr. G. W. E. Loder, Mr. H. W. Monckton, Mr. R. I. Pocock, Dr. A. B. Rendle, the Rt. Hon. Lionel Walter, Baron Rothschild, Dr. E. J. Salisbury, Mr. C. E. Salmon, Miss A. Lorrain Smith, Lt.-Col. J. H. Tull Walsh, and Dr. A. Smith Woodward. The president has appointed Mr. E. T. Browne, Prof. J. B. Farmer, Mr. H. W. Monckton, and Mr. R. I. Pocock vice-presidents. Dame Helen Gwynne-Vaughan was presented at the anniversary meeting with the Trail award and medal, and Sir Ray Lankester with the Linnean medal.

A SUCCESSFUL meeting of the British Lampblown Scientific Glassware Manufacturers' Association, Ltd., was held on June 8 at the Abercorn Rooms, Great Eastern Hotel. Mr. Douglas Baird, vice-president of the association, who occupied the chair, in proposing the toast of "The B.L.S.G.M.A.," gave a short history of the formation of the association. The manufacturers who were members of the association were engaged in work which could be truly designated a "master-key industry," because there was no trade or profession that could be successfully carried on without the aid of one or other of the instruments manufactured by its members. The association was formed during the war because it was found by the Government that there was a great demand for all kinds of instruments for the fighting forces which previous to hostilities had been introduced into this country from abroad, and more particularly from Germany. The Government experienced great difficulty in getting in touch with manufacturers, and it was at the suggestion of the Ministry of Munitions that the B.L.S.G.M.A. was formed. Mr. Baird emphasised the necessity of each member in the association uniting to their utmost in promoting and fostering the industry. He pointed out that it was only by united effort to turn out instruments of the highest class of manufacture that the country could hope to keep out the importation of foreign glassware.

SIR C. H. READ, in his presidential address delivered before the Society of Antiquaries, does not take an optimistic view of the prospects of archæological research. While the late German Government lavished treasures on the Berlin museums, the British Museum, our one institution archæological in its aims, is hampered by lack of funds. Again, the regulations against the export of specimens from countries under our control have proved to be ineffective. For example, specimens found in Cyprus are smuggled to any other art centre rather than to London, and the silver treasures from that island passed easily into the Pierpont Morgan galleries in New York. The same result of Government action is anticipated in India. The president is, however, scarcely fair in his strictures on the Indian Government. Why, he asks, are the Indian museums filled with statuary of the Buddhist age?—things which he believes are hated by Mussulmans and almost equally disliked by Hindus. He forgets that many of the Indian Mussulmans, being converts from Hinduism, have in a measure lost that hatred for representations of the human form which survives in orthodox cities like Cairo. Hindus have recognised Buddha as an incarnation of Vishnu, and the ignorant Hindu villager often worships a figure of the Master as a representation of some local deity, male or even female. But Sir Hercules Read is well justified in pleading for the development of excavation in Babylonia and in Egypt, in which latter country Prof. Flinders Petrie has done admirable work with very limited resources. He also wisely lays stress on the fact that, while our galleries abound in examples of art in its highest forms, we have comparatively little to illustrate the everyday social life of the populations which are now subject to our control.

THE tenth International Cotton Congress was held in Zurich on June 9–11. In the course of its proceedings a highly suggestive paper was read by Dr. W. Lawrence Balls, scientific expert and adviser to the Fine Cotton Spinners' Association, Ltd., Manchester, on "The Nature, Scope, and Difficulties of Research," in which he dealt with the foundation of research, the past and present scope of the research on cotton, the British organisation of cotton researches, and international research. The demand for scientific research, with the view of enlarging the possibilities of the industry, embracing not only the cultivation of the plant, but also every subsequent process in its utilisation, has been induced by various changes in recent years. There is a vast accumulation of experience in the cotton industry, together with a small stock-in-trade of general knowledge. Most of the work of the first decade undertaken by the scientific workers will have to be spent in defining what the spinner knows, and then in reducing the incoherent mass of details to a small number of generalisations easy to grasp. The question of the method of utilisation of the results of research which may be condensed under the title of publication is summed up in a line: To ascertain the true facts, to conceal nothing known, and to take personal responsibility. There must be individualism in effort and communism in knowledge, which is put forward as the code of the pure scientific worker. With respect to a code of research for industry, the author insists on the need for individual effort, but also that after five years the industrial research worker and his employer-colleague shall make known the true facts ascertained, which, whilst giving full advantage to the business concerned, shall yet give fair and full assistance to the general advance of man's power over his environment.

IN *Man* for May Mrs. M. E. Cunnington describes a curious stone mould found on the Worms' Head, Glamorganshire. It is made of two pieces of fine-grained red sandstone about an inch thick. On the corresponding sides of the two stones are matrices for casting four objects: a large ring ornamented with a raised pattern of S-like scrolls enclosed by two narrow rows of irregular chevrons or waved lines, a ring with seven star-like rays, a second ring, and another smaller with a raised pattern of waved lines or loops with seven points. It is suggested that this ornamentation has been designed with some reference to sun-worship, the disc, the rayed star, and the S scrolls being all well-known solar symbols derived from the wheel. From the objects found in association with these moulds it may be inferred that they belong to the Early Iron age. This part of the coast, though difficult of access by land, was easily reached by sea from other parts of Britain and from the Continent. The moulds may thus possibly have been introduced from abroad.

THE Oxford University Press has issued a revised edition of its General Catalogue, which was first produced in 1916. It is not only an excellent description of the varied activities of this great publishing institution, but it is also valuable as a fine example of scientific bibliography, and forms very interesting reading. The Press offers this valuable service to science and literature that the profits derived from school books and other more or less popular works are devoted to the publication of expensive volumes of permanent value which the ordinary publisher may hesitate to produce. One book, Woide's Coptic New Testament, published in 1799, is still on sale. There is an account of the "Dictionary of National Biography," the copyright of which was presented to the University by the family of its founder, the late George M. Smith. Preliminary work under the direction of Mr. H. W. Carless Davis is now in progress with the view of maintaining and extending its usefulness. A history, of course, is given of what is now called the "Oxford Dictionary," which since the death of Sir John Murray in 1915 has been controlled by Dr. H. Bradley and Messrs. W. A. Craigie and C. T. Onions. Nine of the ten volumes are complete, and as steady progress in the tenth volume is being made we may soon look forward to the completion of this monumental work.

IN the Annual Report of the Director of the Field Museum of Natural History, Chicago, for 1919, perhaps the most novel pages are those dealing with the work of the botanical laboratories established by Mrs. Stanley Field. Their main object is to make reproductions of living plants for exhibition in the museum. To accomplish this the plants are studied in the field, wherever they are best to be seen. Thus the first four and a half months of the year were spent in Florida, at a station of the U.S. Department of Agriculture, to secure studies and material for such plants as the coconut palm, the banana, the pineapple, and the Florida cycad. The most perishable parts were cast and coloured, and plaster moulds were made of other parts, formalin material packed and sent to the museum, and photographs, colour sketches, and detail studies secured for use after return. Reproductions were made of many other plants cultivated in the garden of the station. A set of tomatoes attacked by various fungi, then under investigation at the station, was reproduced, and pure cultures of the fungi were obtained with the view of making an enlarged model of each fungus for exhibition alongside the infected fruit.

FEW works of the same size have had so wide an influence on geological thought as R. Liesegang's "Geologische Diffusionen," published in 1913. Applications of the author's views on zonal deposition are to be found, with excellent illustrations, in Professional Papers 107 (p. 156) and 104 (p. 45) of the U.S. Geological Survey. In the former case banded jasper-rock is considered; in the latter, the very common occurrence of bands of iron hydroxide. Messrs. Bastin and Laney, in Paper 104, have made useful experiments with interfusing solutions of ferrous sulphate and sodium hydroxide.

A COLOURED geological map of Western Australia, called a sketch-map, but none the less valuable to libraries, accompanies the Annual Progress Report of the Geological Survey of that State for 1918 (published 1919). Its scale, 1 in. to 50 miles, or about 1 : 3,000,000, is large enough to enable us to appreciate the immense extent of Nullagine (Late Pre-Cambrian?) beds in the north-west, with their auriferous conglomerates; the Jurassic fringe on the west coast; and the Cretaceous overflow on Palæozoic strata in the south-east. An interesting case of serviceable limestone formed by capillary action in sand-dunes is described on p. 14 of the report.

A SUMMARY of the weather for the spring season, comprised by the thirteen weeks ending May 29, is given in the *Weekly Weather Report* issued by the Meteorological Office. Mean air temperature for the period was above the average in all districts of the British Isles, the largest excess being 3·2° F. in England E. and 2·9° F. in England S.E. In Ireland the excess was not more than ½° F., and in Scotland it was only about 1°. At the close of the season the sheltered thermometer exceeded 80° F. in most of the English districts. The day-degrees above 42° F. were largely in excess of the normal over the whole kingdom, especially in England E. and in the English Channel, whilst the day-degrees below 42° F. were largely deficient everywhere, especially in the Midland Counties and in England E. and N.E. Rainfall was everywhere in excess of the normal, the greatest excess being 5·67 in. in England N.W. In the English Channel the excess was only 0·59 in., and in England S.E. and E. 0·63 in. and 0·67 in. respectively. The duration of bright sunshine was normal in Scotland N., but deficient in all other parts of the British Isles. In Scotland W. the deficiency was 109 hours, and in England N.W. and Ireland S. 91 hours.

THE second part of the current volume of the Proceedings of the Royal Irish Academy consists of a paper by the late Prof. J. A. McClelland and Mr. A. Gilmour on the electric charge on rain. The observations were made in a small quadrangle at the back of University College, Dublin, between January 1 and August 31 last year. The results for non-thunderstorm rain are that 73 per cent. of it was charged positively, and 84 per cent. of the electricity brought down was positive. The average charges brought down by the rain were 0·21 electrostatic unit positive and 0·08 negative per c.c. of water. The average vertical currents were $1{\cdot}6 \times 10^{-15}$ amperes per sq. cm. positive and $0{\cdot}5 \times 10^{-15}$ negative. Drops below $0{\cdot}08 \times 10^{-3}$ c.c. were always negatively charged, but there appeared to be no relation between the size of the drop and the magnitude of its charge. Thunderstorm rain was more highly charged than ordinary rain and about equally positive and negative. Snow was more often negative than positive, small hail always negative, and large hail always positive, the charges per c.c. exceeding those on ordinary rain and often those on thunderstorm rain.

IN Publication No. 298 of the Carnegie Institution of Washington (1919) Messrs. E. L. Nichols and H. L. Howes, with the collaboration of Messrs. E. Merritt and D. T. Wilber and Miss F. G. Wick, give the results of a very exhaustive investigation of the fluorescence and absorption spectra of uranyl salts. The authors have examined a large number of simple and double salts, the influence of water of crystallisation and of crystalline form, and the polarised fluorescence of crystals at ordinary temperatures and at the temperature of liquid air. The results obtained at low temperatures are of particular interest, for under these conditions both the absorption and fluorescence bands, which at ordinary temperatures are so diffuse that it is difficult even to locate the positions of the maxima with great precision, are resolved into a number of comparatively sharp components the homologous members of which can be arranged in series having constant wave-number differences. The authors arrive at the generalisation that resolution of the bands on cooling depends on the existence of regular crystalline structure; as an example of this, the broad bands observed in uranium glass are not further resolved on cooling to the temperature of liquid air. It is shown that many of the apparent shifts of the bands with change of temperature are to be referred to the relative enhancement or diminution of the components of the bands. A discussion of different types of phosphoroscope is included as an appendix.

THE May lecture of the Institute of Metals on "Recent Progress in Thermo-Electricity" was delivered by Prof. C. A. F. Benedicks, of Stockholm University, on June 10, Engineer Vice-Admiral Sir George Goodwin, president, in the chair. Prof. Benedicks first gave a short summary of his theoretical views upon the metallic conduction of electricity. A consequence of this theory was that one has to conclude that even in a single homogeneous metal thermo-electric currents do occur, and not only when two different metals are present. Prof. Benedicks gave a concise demonstration of the most important experimental evidence of the truth of this conclusion, utilising for this purpose various metals. In liquid mercury it had been possible for him definitely to prove the existence of thermo-electric currents, thus disproving the negative results of previous workers. A consequence of what the lecturer termed his "homogeneous *thermo-electric* effect" was that there must exist the *reverse* effect, the "homogeneous *electro-thermic* effect," including as a special case the well-known Thomson effect. The reality of this effect was duly made clear. A specially interesting demonstration was of a new rotating thermo-electric apparatus made entirely of copper and rotating in a magnetic field, the driving force originating solely from unequal heating (by means of a tiny gas jet) of thin strips of copper. The point at which the new knowledge brought forward by Prof. Benedicks might have some practical interest lay in the possibility of reducing the thermal conductivity of metals by insulated subdivision into fine wires without impairing the electrical conductivity. The demonstrations were carried out with the aid of a galvanometer kindly provided by the Cambridge and Paul Instrument Co.

DRS. A. HARDEN AND S. S. ZILVA, continuing their work on accessory food substances, publish in the *Biochemical Journal* for April a paper entitled "The Antiscorbutic Requirements of the Monkey." The authors point out that as the clinical symptoms of scurvy induced in the monkey are similar to those occurring in human subjects suffering from a similar disease, the monkey has been more and more extensively employed as an experimental animal. On the other hand, comparative scarcity, high price, and greater duration of experiment render the monkey in many instances less suitable than the guinea-pig for the study of experimental scurvy. In order to translate results obtained with one animal into the terms of the other Drs. Harden and Zilva have attempted to establish a quantitative relationship, as regards dose and time, between them. In the work described five monkeys fed on a scorbutic diet of rice, wheat germ, salt mixture, and butter received respectively 0·5 c.c., 0·75 c.c., 1 c.c., 2 c.c., and 5 c.c. respectively of orange juice daily. The animals receiving only 0·5 c.c. or 0·75 c.c. developed scurvy with fatal results, whilst the one receiving 1 c.c. only suffered from a mild attack, and in the cases of 2 c.c. and 5 c.c. doses the animals remained quite healthy. The authors conclude that the minimum daily dose of fresh orange juice for a monkey (weighing 2–3 kilos.) is 1–2 c.c., which is approximately the amount required by a guinea-pig weighing 300–400 grams. Whilst, however, the minimum dose of antiscorbutic required by the two animals is of the same order, the disease develops in the guinea-pig in three weeks, but only after two months in the monkey.

IN pursuance of his campaign for recognition as a pioneer inventor of oil engine cycles, we have received a number of documents from Mr. Herbert Akroyd Stuart, formerly an assistant at Finsbury Technical College and now of Claremont, in Western Australia. One type of Mr. Stuart's engines has been manufactured on a large scale by Messrs. Hornsby, of Grantham. The cycle in this engine is carried out in a cylinder fitted with a hot bulb, the walls of which are kept hot during ordinary working by the heat developed during explosion. Air is drawn into the cylinder through a side-port in front of the bulb, and oil fuel injected into the bulb during the suction stroke. Compression follows, and at the end of this stroke ignition takes place due to the temperature developed by the hot walls and by the compression. Mr. Stuart's other cycle has not been worked commercially to any extent. It also is carried out in a hot-bulb cylinder, and consists in drawing in air only during the suction stroke, compression of this air, and injection of oil fuel into the bulb during the early part of the working stroke, the temperature being then sufficient to cause the oil to burn readily. Both these cycles were invented in 1890. Mr. Stuart objects, and rightly so, to the name "semi-Diesel" being applied to engines working on these cycles. He has first claim as the inventor of hot-bulb engines, and the term "Akroyd cycle" would be suitable. The Diesel engine proper has no hot bulb; air alone is compressed to a very high pressure (500 lb. per sq. in.), and the temperature due to compression alone is sufficient to ignite the oil fuel which is injected during the early part of the working stroke. The term "Diesel engine" might continue to be used for such engines. The high pressures used in the Diesel engine and the extensive use of the engine for marine purposes gave rise to a demand for an engine working with lower pressures, and the past few years have seen a great development in hot-bulb engines. Someone acquainted with Diesel engines and probably unaware of Mr. Stuart's prior work named these "semi-Diesel," a term which may very well be dropped in favour of Akroyd engines, if only for the sake of historical accuracy.